

IN THE CLAIMS

1. (presently amended) A curable resin composition which comprises (i-1) an epoxy compound having an ionic polymerizability and viscosity of not more than 1,000 cP at 25°C, (i-2) an acrylic resin having an ionic polymerizable functional group, and (3) a thermally-activating ionic polymerization catalyst which can be dissolved by heating and crystallized by cooling; said polymerization catalyst having a substituted hydrocarbon group having a carbon number of more than 10, or a nonsubstituted hydrocarbon group having a carbon number of more than 10, or a cyclic organic structure having a more than 10 carbon number hydrocarbon group.

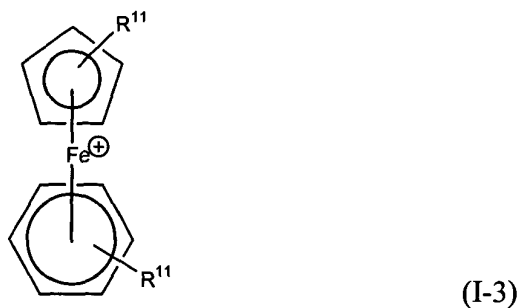
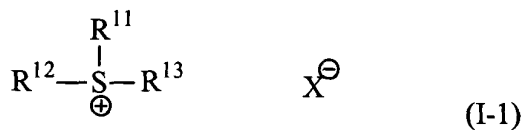
a' 2. (presently amended) A curable resin composition as claimed in claim 1, wherein said epoxy compound (i-1) has 1-2 ~~pieces of epoxy groups in the~~ epoxy groups per molecule, and at least one ~~piece~~ of said epoxy groups is a cycloaliphatic epoxy group.

3. (presently amended) A curable resin composition as claimed in claim 1 or 2, wherein said acrylic resin (i-2) has a hydroxyl group, and, a glycidyl group and/or a cycloaliphatic epoxy group.

4. (presently amended) A curable resin composition ~~as claimed in any one of~~ claims according to claim 1-3, wherein said thermally-activating ionic polymerization catalyst (3) contains at least one selected from the group consisting of a cationic polymerization catalyst (3') and a metal compound (3").

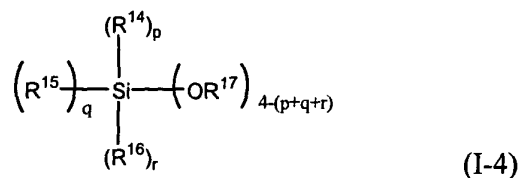
5. (original) A curable resin composition as claimed in claim 4, wherein said cationic polymerization catalyst (3') is a compound having a substituted or nonsubstituted hydrocarbon group of a carbon number of not less than 10 or at least one cyclic organic structure containing a substituted or nonsubstituted hydrocarbon group of a carbon number of not less than 10 in the molecule.

6. (presently amended) A curable resin composition ~~as claimed in any one of claims~~ according to claim 4-5, wherein said cationic polymerization catalyst (3') is at least one selected from the group consisting of sulphonium salt represented by general formula (I-1), an iodonium salt represented by general formula (I-2), an aromatic iron compound represented by general formula (I-3), an organic silicone compound represented by general formula (I-4), and a compound represented by general formula (I-5);

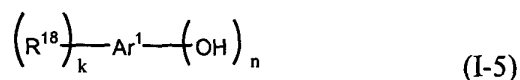


(in the general formulae, R^{11} , R^{12} , and R^{13} may be identical to or different from each other, and which are a hydrogen atom, a substituted or nonsubstituted hydrocarbon group of a carbon number of 1-30, and a substituted or nonsubstituted aromatic group or heteroaromatic group,

respectively, provided that there is contained at least one substituted or nonsubstituted hydrocarbon group of a carbon number of not less than 10 or at least one cyclic organic structure containing a substituted or nonsubstituted hydrocarbon group of a carbon number of not less than 10 in the molecule; X is SbF₆, AsF₆, PF₆, or BF₄, and an anionic derivative thereof in which at least one ~~piece~~ of fluorine atom is substituted with a hydroxyl group, an anion selected from the group consisting of CF₃SO₃, ClO₄, a halogen atom, R¹-COO, and R²-SO₃; Herein, R¹ and R² are an alkyl group or phenyl group which may be ~~even~~ substituted with an alkyl group, or a halogen atom, or nitro group, or cyano group, or ~~and~~ alkoxy group, ~~etc.~~)



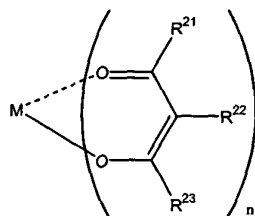
21 (in the general formula, R¹⁴, R¹⁵, R¹⁶ and R¹⁷ may be identical to or different from each other, and which are a hydrogen atom, a substituted or nonsubstituted hydrocarbon group of a carbon number of 1-30, and a substituted or nonsubstituted aromatic group or heteroaromatic group, respectively, provided that there is contained at least one substituted or nonsubstituted hydrocarbon group of a carbon number of not less than 10 or at least one cyclic organic structure containing a substituted or nonsubstituted hydrocarbon group of a carbon number of not less than 10 in the molecule; "p", "q", and "r" are an integer of 0-3, and "p+q+r" is not more than 3.)



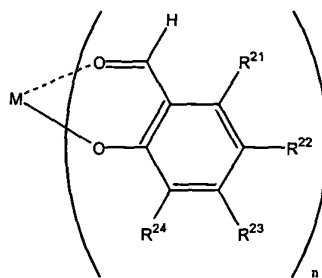
(in the general formula, Ar¹ is a substituted or nonsubstituted aromatic group or heteroaromatic group, R¹⁸ may be identical or different, and which is a hydrogen atom, a substituted or nonsubstituted hydrocarbon group of a carbon number of 1-30, and a substituted or

nonsubstituted aromatic group or heteroaromatic group, respectively, provided that there is contained at least one substituted or nonsubstituted hydrocarbon group of a carbon number of not less than 10 or at least one cyclic organic structure containing a substituted or nonsubstituted hydrocarbon group of a carbon number of not less than 10 in the molecule; "k" and "n" are an integer of 1-7, respectively).

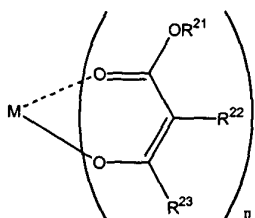
7. (presently amended) A curable resin composition ~~as claimed in any one of claims according to claim~~ 4-6, wherein said metal compound (3") is at least one kind selected from the group consisting of a compound represented by general formula (II-1), a compound represented by general formula (II-2), and a compound represented by general formula (II-3):



(II-1)



(II-2)



(II-3)

(in the general formula, R^{21} , R^{22} , R^{23} , and R^{24} may be identical to or different from each other, and which are a hydrogen atom, a substituted or nonsubstituted hydrocarbon group of a carbon

number of 1-30, respectively, provided that there are contained at least one of R^{21} , R^{22} , R^{23} , and R^{24} having a carbon number of not less than 10 in one ligand; M is selected from the group consisting of Al, Ti, Cr, Mn, Fe, Co, Ni, Cu, Zr, Zn, Ba, Ca, Ce, Pb, Mg, Sn, and V; "n" is a integer of 2-4).

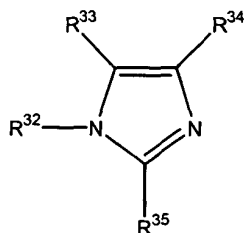
8. (presently amended) A curable resin composition ~~as claimed in any one of claims~~ according to claim 1-7, wherein said thermally-activating ionic polymerization catalyst (3) contains said metal compound (3") and at least one kind selected from the group consisting of an organosilane having hydroxyl group directly connected to silicone atom, an organosiloxane having hydroxyl group directly connected to silicone atom, a phenol compound, an organic silicone compound having hydrolyzable group directly connected to silicone atom, and a silicone compound which can produce silanol group by photo-irradiation.

a' 9. (presently amended) A curable resin composition ~~as claimed in any of claims~~ according to claim 1-3, wherein said thermally-activating ionic polymerization catalyst (3) contains at least one kind selected from the group consisting of a compound represented by general formulae (III-1') and (III-2),



(in the general formula (III-1'), R^1 , R^2 , and R^3 may be identical to or different from each other, and which are a hydrogen atom, a substituted or nonsubstituted hydrocarbon group of a carbon number of 1-30, and an aromatic group or heteroaromatic group having a substituted or nonsubstituted hydrocarbon group, respectively, provided that there is contained at least one substituted or nonsubstituted hydrocarbon group of a carbon number of not less than 10 or at

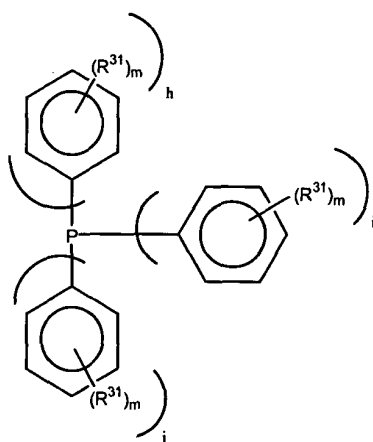
least one of an aromatic group or heteroaromatic group having a substituted or nonsubstituted hydrocarbon group of a carbon number of not less than 10-)



(III-2)

(in the general formula (III-2), R³², R³³, R³⁴, and R³⁵ may be identical to or different from each other, and which are a hydrogen atom, a substituted or nonsubstituted hydrocarbon group of a carbon number of 1-30, respectively, provided that at least two of R³², R³³, R³⁴, and R³⁵ are a hydrocarbon group having a carbon number of not less than 10-).

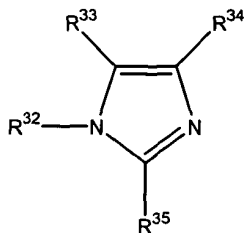
10. (presently amended) A curable resin composition ~~as claimed in any one of~~ claims according to claim 1-3, wherein said thermally-activating ionic polymerization catalyst (3) contains at least one kind selected from the group consisting of a compound represented by general formulae (III-1) and (III-2),



(III-1)

(in the general formula (III-1), R³¹ may be identical to or different, and which are a hydrogen atom, or a substituted or nonsubstituted hydrocarbon group of a carbon number of 1-30, provided

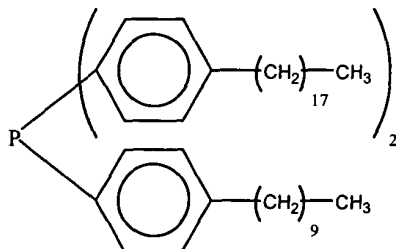
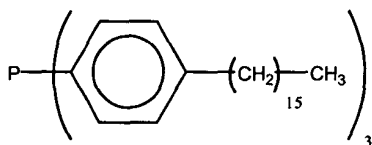
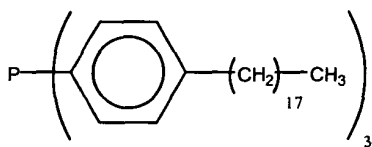
that at least one R^{31} in one molecule has a carbon number of not less than 10; “h”, “i”, and “j” are an integer of satisfying “h+i+j=3”, and “m” is an integer of 1-5.)

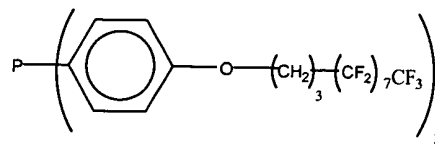
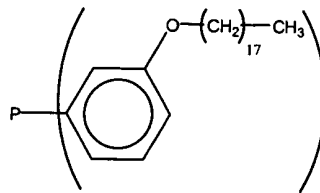
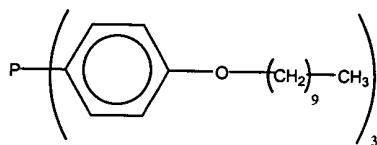
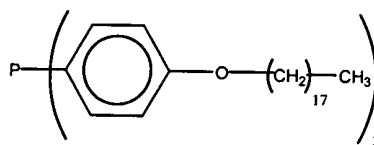
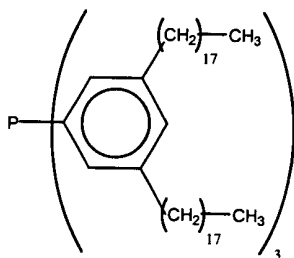
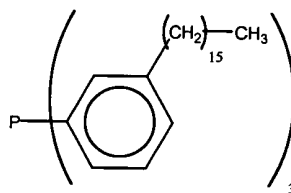
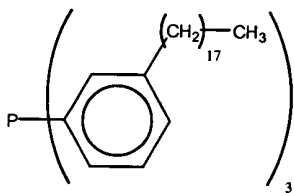
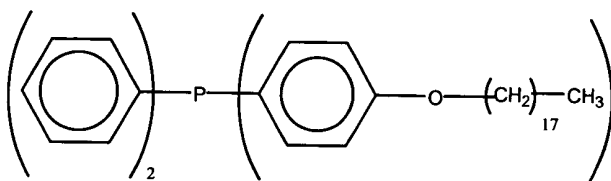
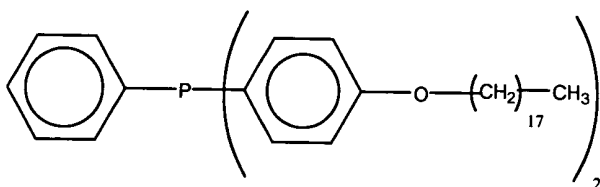
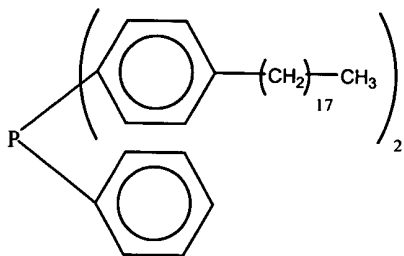


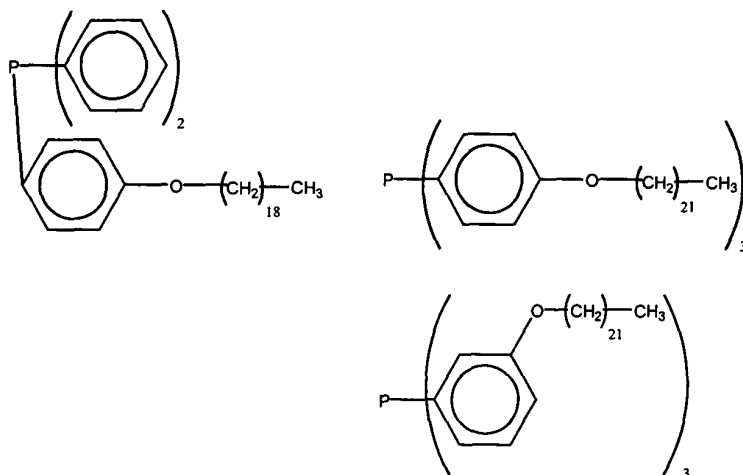
(III-2)

(in the general formula (III-2), R^{32} , R^{33} , R^{34} , and R^{35} may be identical to or different from each other, and which are a hydrogen atom, a substituted or nonsubstituted hydrocarbon group of a carbon number of 1-30, respectively, provided that at least two of R^{32} , R^{33} , R^{34} , and R^{35} are a hydrocarbon group having a carbon number of not less than 10.)

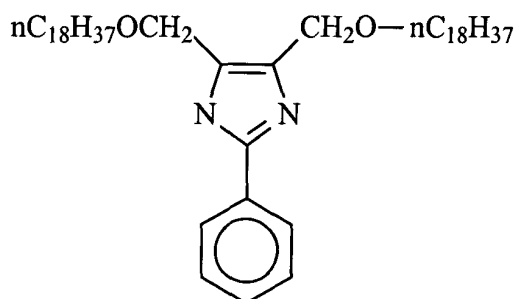
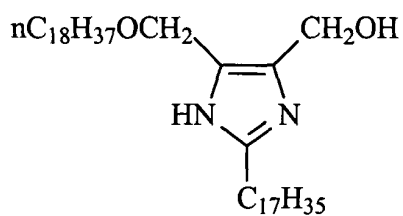
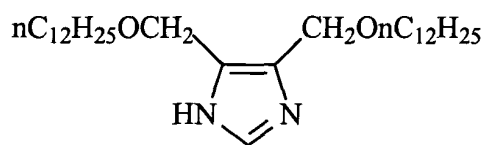
11. (presently amended) A curable resin composition as claimed in claim 10, wherein said compound represented by general formula (III-1) is at least one kind selected from groups shown below:







12. (presently amended) A curable resin composition as claimed in claim 9 or 10, wherein said compound represented by the formula (III-2) is at least one kind selected from the group shown below:



13. (presently amended) A curable resin composition ~~as claimed in any one of~~ claims according to claim 1-12, which is employed for coating cans.

14. (presently amended) A method for the preparation of a curable resin composition characterized in that there is prepared an acrylic resin (i-2) having functional groups which are capable of reacting with ionic species in a curable resin composition ~~as claimed in any one of claims~~ according to claim 1-12 under a condition of the absence of a volatile solvent by polymerizing monomers constructing an acrylic resin (i-2) in an epoxy compound (i-1).

15. (presently amended) A coated article ~~which comprises coating a curable resin composition as claimed in any one of claims 1-12 on a substrate, and curing comprising a~~ substrate and a coating on said substrate, wherein said coating is formed from curing the curable resin composition set forth in any of claims 1-12.

16. (presently amended) A solvent-based coating composition which comprises (ii-1) an epoxy compound ~~compounds~~ having at least two cycloaliphatic epoxy groups in the molecule and a number average molecular weight of not more than 2,000, (ii-2) an acrylic resin containing an epoxy group and having a number average molecular weight of 2,000-50,000, a hydroxyl group value of 10-250 mgKOH/g, and an epoxy equivalent of not more than 300, and (3) a thermally-activating ionic polymerization catalyst which can dissolve by heating and crystallize by cooling; said polymerization catalyst having a substituted hydrocarbon group having a carbon number of more than 10, or a nonsubstituted hydrocarbon group having a carbon number of more than 10, or a cyclic organic structure having a more than 10 carbon number hydrocarbon group.

17. (original) A solvent-based coating composition as claimed in claim 16, wherein said epoxy group in said acrylic resin (ii-2) containing an epoxy group is a cycloaliphatic epoxy group or an epoxy group derived from glycidylmethacrylate.

18. (presently amended) A solvent-based coating composition which comprises (ii-1) an epoxy compound having at least two cycloaliphatic epoxy groups in the molecule and a number average molecular weight of not more than 2,000, (ii-2) an acrylic resin containing an epoxy group and having a number average molecular weight of 2,000-50,000, a hydroxyl group value of 10-250 mgKOH/g, and an epoxy equivalent of not more than 300, and (3) a thermally-activating ionic polymerization catalyst which can dissolve by heating and crystallize by cooling;

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~~A solvent-based coating composition as claimed in claim 16 or 17, wherein said epoxy compound (ii-1) further contains at least one kind selected from a bisphenol-type epoxy resin, a novolak-type epoxy resin, and a brominated-type epoxy resin therefrom is mixed with an additional epoxy selected from the group consisting of a bisphenol-type epoxy compound, a novolak-type epoxy compound, and a brominated-type epoxy compound thereof is mixed with an additional epoxy selected from the group consisting of bisphenol-type epoxy compound, a novolak-type epoxy compound, and a brominated-type epoxy compound thereof.~~

19. (presently amended) A solvent-based coating composition as claimed in either claim 16-18, or claim 18, wherein oxirane oxygen concentration is 5-11% by weight in a resin composition composed of said epoxy compound (ii-1) and said acrylic resin (ii-2) containing an epoxy group.

20. (presently amended) A solvent-based coating composition ~~as claimed in claim 16-~~ according to claim 19, wherein said thermally-activating ionic polymerization catalyst (3) is a catalyst as described in ~~claims~~ claim 4-12.

21. (presently amended) A solvent-based coating composition ~~as claimed in claims 16-20~~ according to claim 18 which is employed for coating cars.

22. (presently amended) A coated article ~~which comprises coating a solvent-based coating composition as claimed in claims 16-20 onto a substrate, and curing comprising a substrate and a coating on said substrate, wherein said coating is formed from curing the curable resin composition set forth in any of claims 16-20.~~

23. (presently amended) A resin composition for insulating a laminated printed circuit board which comprises (iii-1) a monomer having at least one functional group having ionic polymerizability, (iii-2) a polymeric compound having at least one functional group having ionic polymerizability, a (3) a thermally-activating ionic polymerization catalyst which can dissolve by heating and crystallize by cooling; said polymerization catalyst having a substituted hydrocarbon group having a carbon number of more than 10, or a nonsubstituted hydrocarbon group having a carbon number of more than 10, or a cyclic organic structure having a more than 10 carbon number hydrocarbon group.

24. (presently amended) A resin composition for insulating a laminated printed circuit board as claimed in claim 23, wherein said monomer (iii-1) has a viscosity of not more than 1,000 cP/25°C and 1-2 ~~pieces of epoxy groups in the~~ epoxy groups per molecule, and at least one of said epoxy groups is a cycloaliphatic epoxy group.

25. (original) A resin composition for insulating a laminated printed circuit board as claimed in claim 23 or 24, wherein said polymeric compound (iii-2) has a cycloaliphatic epoxy group.

26. (presently amended) A resin composition for insulating a laminated printed circuit board ~~as claimed in any one of claims~~ according to claim 23-25, wherein said polymeric compound (iii-2) is an acrylic resin polymerized in said monomer (iii-1) containing 3,4-epoxycyclohexylmethyl (meth) acrylate.

27. (presently amended) A resin composition for insulating a laminated printed circuit board ~~as claimed in any one of claims~~ according to claim 23-26, wherein said thermally-activating ionic polymerization catalyst (3) is a catalyst ~~described in claims~~ according to claim 4-12.

28. (presently amended) A laminated printed circuit board which comprises coating a resin composition for insulating a laminated printed circuit board ~~as claimed in any one of claims~~ according to claim 23-27 onto a substrate and curing, which has resin layers for insulating between layers.

29. (presently amended) A curable resin composition which comprises (iv-1) an epoxy resin having ionic polymerizability and (3) a thermally-activating ionic polymerization catalyst which can dissolve by heating and crystallize by cooling; said polymerization catalyst having a substituted hydrocarbon group having a carbon number of more than 10, or a nonsubstituted hydrocarbon group having a carbon number of more than 10, or a cyclic organic structure having a more than 10 carbon number hydrocarbon group.

30. (original) A curable resin composition as claimed in claim 29, wherein said epoxy resin (iv-1) is a polyfunctional epoxy resin and at least one of epoxy groups is a cycloaliphatic epoxy group.

31. (presently amended) A curable resin composition as claimed in claim 29 or 30, wherein said thermally-activating ionic polymerization catalyst (3) is a catalyst as described in ~~claims~~ claim 4-12.

32. (presently amended) A protecting layer for a color filter ~~which comprises coating curable resin composition as claimed in any one of claims 29-31 onto a substrate,~~ comprising a coating formed from curing the curable resin composition set forth in any of claims 29-31, wherein said protecting layer is deposited on a substrate.

33. (original) A color filter using a protecting layer for a color filter as claimed in claim 32.

34. (original) A liquid crystal display device using a protecting layer for a color filter as claimed in claim 32.

35. (presently Amended) A curable resin composition which comprises (v-1) an epoxy compound having ionic polymerizability and a viscosity of not more than 1,000 cP at 25°C, (v-4) an oxetane compound having 1-6 ~~pieces of~~ oxetane rings ~~in one~~ per molecule, and (3) a thermally-activating ionic polymerization catalyst which can dissolve by heating and crystallize by cooling; said polymerization catalyst having a substituted hydrocarbon group having a carbon number of more than 10, or a nonsubstituted hydrocarbon group having a carbon number of more than 10, or a cyclic organic structure having a more than 10 carbon number hydrocarbon group.

36. (presently amended) A curable resin composition which comprises (v-1) an epoxy compound having ionic polymerizability and a viscosity of not more than 1,000 cP at 25°C, (v-2) an acrylic resin having a functional group of ionic polymerizability, (v-4) an oxetane compound having 1-6 ~~pieces of~~ oxetane rings ~~in one~~ per molecule, and (3) a thermally-activating ionic polymerization catalyst which can dissolve by heating and crystalize by cooling; said polymerization catalyst having a substituted hydrocarbon group having a carbon number of more than 10, or a nonsubstituted hydrocarbon group having a carbon number of more than 10, or a cyclic organic structure having a more than 10 carbon number hydrocarbon group.

37. (presently amended) A curable resin composition as claimed in claim 35 or 36, wherein said epoxy compound (v-1) has ~~one 1-4 pieces of epoxy groups in the~~ epoxy groups per molecule and wherein at least one piece of at least one of said epoxy groups is a cycloaliphatic epoxy group.

38. (presently amended) A curable resin composition ~~as claimed in any one of~~ claims according to claim 35-37, wherein said epoxy compound (v-1) ~~further contains at least one kind selected from a bisphenol-type epoxy resin, a novolak-type epoxy resin, and a brominated-type epoxy resin therefrom~~ is mixed with an additional epoxy selected from the group consisting of a bisphenol-type epoxy compound, a novolak-type epoxy compound, and a brominated-type epoxy compound thereof.

39. (presently amended) A curable resin composition ~~as claimed in any one of~~ claims according to claim 36-38, wherein said acrylic resin (v-2) has a hydroxyl group and; a glycidyl group and/or a cycloaliphatic epoxy group.

40. (presently amended) A curable resin composition ~~as claimed in any one of claims according to claim~~ 35-39, wherein said thermally-activating ionic polymerization catalyst (3) is a catalyst as claimed in ~~claims~~ claim 4-12.

41. (presently amended) A curable resin composition ~~as claimed in any one of claims according to claim~~ 35-40, which is employed for coating cans.

42. (presently amended) A coated article ~~which comprises coating a curable resin composition as claimed in claims 35-40 onto a substrate, and curing comprising a substrate and a coating on said substrate, wherein said coating is formed from curing the curable resin composition set forth in any of claims 35-40.~~

43. (new) A solvent-based coating composition which comprises (ii-1) an epoxy compound having at least two cycloaliphatic epoxy groups in the molecule and a number average molecular weight of not more than 2,000, (ii-2) an acrylic resin containing an epoxy group and having a number average molecular weight of 2,000-50,000, a hydroxyl group value of 10-250 mgKOH/g, and an epoxy equivalent of not more than 300, and (3) a thermally-activating ionic polymerization catalyst which can dissolve by heating and crystallize by cooling; wherein said epoxy group in said acrylic resin (ii-2) containing an epoxy group is a cycloaliphatic epoxy group or an epoxy group derived from glycidylmethacrylate and wherein said epoxy compound (ii-1) is mixed with an additional epoxy selected from the group consisting of a bisphenol-type epoxy compound, a novolak-type epoxy compound, and a brominated-type epoxy compound thereof.
